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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/815,958	03/23/2001	Alvin D. Compaan	1-22335	6483
4859	7590	11/26/2003		
MACMILLAN SOBANSKI & TODD, LLC ONE MARITIME PLAZA FOURTH FLOOR 720 WATER STREET TOLEDO, OH 43604-1619				
			EXAMINER I.E., DUNG ANH	
			ART UNIT 2818	PAPER NUMBER

DATE MAILED: 11/26/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/815,958

Applicant(s)

COMPAAN ET AL.

Examiner

DUNG A LE

Art Unit

2818

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 September 2003.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 and 29-43 is/are pending in the application.
- 4a) Of the above claim(s) 13-28, 33, 38, 42 and 43 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 and 29-32, 34-37, 39-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)                      4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)                      5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_                      6) ☐ Other: \_\_\_\_\_

### **Response to Amendment**

This Office Action is in response to Amendment filed on 9/30/03.

Claims 13-28, 33, 38, 42 and 43 have been cancelled.

Claims 1, 7, 29 and 34 has been amended.

Claims 29-43 are newly added.

Claims 1-12 and 29-43 are pending in the present application at the time of examination.

### **Claim Rejections**

#### **Set of claims 1-6 and 40**

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

**Claims 1-5 are rejected under 35 USC 102 (b) as being anticipated by Murakami et al. (5786269).**

Murakami et al. teaches a method of making a semiconductor comprising: depositing a group II-group VI compound onto a substrate in the presence of nitrogen using sputtering to produce a nitrogen-doped p-type semiconductor (col 4, lines 50-67).

**Regarding claim 2**, the nitrogen is in a gaseous form during the sputtering. (col 4, line 55)

**Regarding claim 3**, the group II-group VI compound is one, or more compounds of the group zinc telluride, zinc selenide (col. 2 , line 65), zinc sulfide, mercury selenide, mercury telluride, mercury sulfide, cadmium sulfide, cadmium telluride, cadmium selenide, magnesium telluride, and magnesium selenide.

**Regarding claim 4**, the sputtering is RF sputtering (col 4, line 62).

**Regarding claim 5**, the sputtering is reactive sputtering (col 4, line 62).

**Claims 6 and 40 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Murakami et al. as applied to claim 1 above and in view of the following remark.**

**Regarding claim 6, Regarding claim 12**, Murakami et al. do not teach sputtering step creates a layer of the doped group II-group VI compound that is larger than about 4 cm<sup>2</sup>.

Since applicant has not disclosed that the abovementioned limitation solve any stated problem or is for any particular purpose and it appears that the invention would perform equally well with Murakami 's area. or any other areas may used.

**Regarding claim 40**, Murakami et al. do not teach the group II-group VI compound is zinc telluride and the nitrogen-doped semiconductor is a p-type layer.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the group II-group VI compound is zinc telluride and the nitrogen-doped semiconductor is a p-type layer from the nitrogen-doped semiconductor, which are commonly used to obtain the best resultant semiconductor, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended application

**Set of claims 7-12 and 41**

**Claims 7- 11** are rejected under 35 USC 102 (b) as being anticipated by Murakami et al. (5786269).

**Murakami et al.** shows a method of making a photovoltaic cell comprising using sputtering to apply a p- type back contact layer of group II group VI compound to a substrate in the presence of nitrogen, the back coating layer being doped with nitrogen (col 4, lines 50- 67).

**Regarding claim 8**, the nitrogen is in a gaseous form during the sputtering. (col 4, line 55)

**Regarding claim 9**, the group II-group VI compound is one or more compounds of the group zinc telluride, zinc selenide, zinc sulfide, mercury selenide, mercury telluride, mercury sulfide, cadmium sulfide, cadmium telluride, cadmium selenide, magnesium telluride, and magnesium selenide.

**Regarding claim 10 and 11**, the sputtering is RF sputtering and the sputtering is reactive sputtering.(col 4, line 62).

**Claims 12 and 41 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Murakami et al. as applied to claim 7 above and in view of the following remark.**

**Regarding claim 12**, Murakami et al. do not teach sputtering step creates a layer of the doped group II-group VI compound that is larger than about 4 cm<sup>2</sup>.

Since applicant has not disclosed that the abovementioned limitation solve any stated problem or is for any particular purpose and it appears that the invention would perform equally well with Murakami 's area. or any other areas may used.

**Regarding claim 41**, Murakami et al. do not teach the group II-group VI compound is zinc telluride and the nitrogen-doped semiconductor is a p-type layer.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the group II-group VI compound is zinc telluride and the

nitrogen-doped semiconductor is a p-type layer form the nitrogen-doped semiconductor, which are commonly used to obtain the best resultant semiconductor, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended application

**Set of claims 29-32**

**Claims 29- 32 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Murakami et al. (5786269) in view of Niwa (55778501) and further in view of the following remark.**

Murakami et al.. show a method of making a semiconductor comprising depositing a group II-group VI compound onto a substrate using sputtering to produce a nitrogen-doped p-type semiconductor doping, wherein the sputtering is carried out in an atmosphere containing an amount of nitrogen.

Murakami et al. do not show that wherein the sputtering is carried out in an atmosphere containing an amount of nitrogen within the range of from about 0.5 percent to about 3 percent.

Niwa teaches the step of the sputtering is carried out in an atmosphere containing an amount of nitrogen within the range at the range of 5% or less (col 10, lines 30- 35).

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to the step of the sputtering is carried out in an atmosphere

containing an amount of nitrogen within the range of from about 0.5 percent to about 3 percent, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

**Regarding claim 30**, the remainder of the atmosphere is argon gas (col 12, line 55, Niwa).

**Regarding claim 31**, Shaw teaches the group II-group VI compound is one or more compounds of the group zinc telluride, zinc selenide, zinc sulfide, mercury selenide, mercury telluride, mercury sulfide, cadmium sulfide, cadmium telluride, cadmium selenide, magnesium telluride, and magnesium selenide (col 3, line 65, Murakami et al.)

**Claim 32 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Murakami et al. and Niwa as applied to claim 29 above and in view of the following remark.**

Murakami et al. and Niwa do not teach the group II-group VI compound is zinc telluride

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the group II-group VI compound is zinc telluride, which are commonly used to obtain the best resultant semiconductor, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended application



**Set of claims 34- 37 and 39.**

**Claims 34- 37 and 39 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Murakami et al. in view of Niwa (55778501) and further in view of the following remark.**

Murakami et al. teach a method of making a photovoltaic cell comprising using sputtering to apply a back contact p-type layer of group II-group VI compound to a substrate in the presence of nitrogen, the back coating layer being doped with nitrogen, wherein the sputtering is carried out in an atmosphere containing an amount of nitrogen.

Murakami et al. do not show that wherein the sputtering is carried out in an atmosphere containing an amount of nitrogen within the range of from about 0.5 percent to about 3 percent.

Niwa teaches the step of the sputtering is carried out in an atmosphere containing an amount of nitrogen within the range at the range of 5% or less (col 10, lines 30- 35).

It would have been obvious to one having ordinary skill in the art at the time of the invention was made to the step of the sputtering is carried out in an atmosphere containing an amount of nitrogen within the range of from about 0.5 percent to about 3 percent, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art.

**Regarding claim 35**, the remainder of the atmosphere is argon gas (col 12, line 55, Niwa).

**Regarding claim 36**, Shaw show the group II-group VI compound is one or more compounds of the group zinc telluride, zinc selenide, zinc sulfide, mercury selenide, mercury telluride, mercury sulfide, cadmium sulfide, cadmium telluride, cadmium selenide, magnesium telluride, and magnesium selenide (col 3, line 65, Murakami et al. )

**Claim 37 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Murakami et al. and Niwa as applied to claim 34 above and in view of the following remark.**

Murakami et al. do not teach the group II-group VI compound is zinc telluride

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the group II-group VI compound is zinc telluride, which are commonly used to obtain the best resultant semiconductor, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended application.

**Claim 39 is rejected under 35 U.S.C. 103 (a) as being unpatentable over Murakami et al. and Niwa as applied to claim 34 above and in view of Compaan (5,393,675 in record/IDS) .**

Murakami et al. and Niwa do not teach the sputtering is reactive sputtering.

However, Compaan shows that the RF (magnetron) sputtering system 30 in utilizes a 13.56 Mhz generator and power monitor 36 with a network impedance matching system (Figure. 3, col 6, lines 10-15) and an atmosphere of gas having ions (col 6, lines 42-44).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to employ the sputtering is reactive sputtering to form the semiconductor layer, as taught by Compaan, in order to form the semiconductor layer having the thickness as thin as possible to minimize the amount of light absorbed in the top layer and also having the doping level to minimize ohmic losses.

### Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, THIS ACTION IS MADE FINAL. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

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extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dung A. Le whose telephone number is 703-306-5797. The examiner can normally be reached on Monday-Friday 8:00am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Nelms can be reached on 703-308-4910. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

**Dung A. Le**

**P. Examiner**

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